

Information on the dataset ‘Modelling best management practices for reducing nutrient losses from agricultural catchments under different climate trajectories’

This dataset is related to the manuscript of Wynants *et al.* 2023. *How to achieve a 50% reduction in nutrient losses from agricultural catchments under different climate trajectories?*

It contains three folders:

1. The *Geospatial Information* folder contains all the geospatial data for both study catchments. These include land cover, soil, DEM, and finally the Soil Land Cover maps, which were used to build the HYPE models. The coding of the geospatial shapefiles and raster files can be found in the Readme document.
2. The *HYPE_model* folder contains all of the HYPE model building blocks necessary to run the calibrated model for Hestadbäcken and Tullstorpsån in separate subfolders. It also contains the goodness-of-fit outcomes for both the calibrated model and the validation period. This folder also contains the building blocks to run the future climate forecasts and the different management scenarios.
3. The *outputs_and_data_analysis* folder contains csv files with all of the model outcomes for IN, TP, and Q in both catchments for all combinations of RCP, period, and climate models. It also contains R scripts used to calculate trends, summary statistics, t-tests, and plot the figures. Moreover, it contains the outcomes of the percentages of change, correlation tests, and t-tests.

For instruction on how to use the HYPE model, we refer to <https://hypeweb.smhi.se/model-water/>
For more information on how we obtained the rainfall and temperature predictions under different relative concentration pathways, we refer to the manuscript. A total of 8 best management scenarios were tested. Due to differences between the catchments, some scenarios are only tested in one catchment.

Scenario name	Description
Current	In <u>Hestadbäcken</u> , ca. 2500 m ² of floodplain & wetland (0.03% of catchment). In <u>Tullstorpsån</u> , ca. 0.51 km ² of floodplain & wetland (0.82% of catchment).
Baseline	In <u>Hestadbäcken</u> , 200 m ² (0.003% of catchment) of floodplain & wetland. In <u>Tullstorpsån</u> , 0.08 km ² (0.13% of catchment) of floodplain & wetland
20%Fert (Fert)	20 % reduction in mineral fertiliser application
Cover crops (CC)	All spring crops and root crops get a cover crop in between growing seasons. Only applicable to Tullstorpsån.
Stream mitigation (SM)	In <u>Hestadbäcken</u> , floodplains & wetlands increase in size to ca. 61,100 m ² (0.80% of the catchment) with a barrier of 30 cm between stream. In <u>Tullstorpsån</u> , floodplains & wetlands increase to 0.62 km ² (1.0% of catchment) with a barrier of 30 cm between stream.
Fert+CC	Combination of scenarios 20%Fert and Cover Crops. Only Tullstorpsån
SM+Fert	Combination of 20%Fert and Stream Mitigation
SM+Fert+CC	Combination of 20% Fert, Cover Crops, and Stream Mitigation. Only Tullstorpsån